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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/905,349	07/13/2001	Jay Brian DeDontney	A-67178-1/MSS	7344

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EXAMINER	
ZERVIGON, RUDY	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/905,349	DEDONTNEY ET AL.	
	Examiner	Art Unit	
	Rudy Zervigon	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-11,16 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-11,16 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. A text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 4, 5, 8, 11, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) in view of Ohashi (JP10-177960)[1]. Soichiro Kawakami teaches a gas delivery metering tube (Figure 1) for delivering a gas in a plasma CVD process comprising:

i. an elongated outer tube (3) having an inlet end (4/3 interface) and a closed end (opposite end), and one or more arrays of outer orifices (15) formed in a elongated outer tube (3) and extending along a substantial length of a surface of said outer tube (3); an elongated inner tube (5) having open inlet (4/5 interface) and outlet (opposite 4/5 interface) ends, a elongated inner tube (5) being nested and axially aligned inside of a elongated outer tube (3) forming an effective annular space (20) are between, and wherein a outlet end of a elongated inner tube (5) terminates prior to a closed end (opposite end) of a elongated outer tube (3).

Soichiro Kawakami further teaches a gas delivery metering tube further comprising a single gas supply port (inherent, feeding item 5, Figure 1) coupled to a inlet end (at cut away of item 5) of a elongated inner tube (5) for supplying gas to a metering tube.

Soichiro Kawakami does not teach:

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[1] Machine translation from http://www1.ipdl.jpo.go.jp

i. a gas flow divider positioned adjacent a inlet ends of a elongated inner and outer tubes (5,3), said divider configured to introduce a first gas flow path into a inlet of said inner tube (5) and a second gas flow path into a annular space (20) between a elongated inner and outer tubes (3,5).

ii. Soichiro Kawakami's gas delivery metering tube wherein a cross sectional area of a inside of a elongated inner tube (5) is approximately equal to a total cross sectional area of a plurality of small orifices in a flow divider

iii. Soichiro Kawakami's inner tube (5) extends at least along a arrays of outer orifices in a outer tube (3)

iv. Soichiro Kawakami's array of orifices (15) formed in a elongated outer tube (3) are configured to establish uniform backing pressure with Soichiro Kawakami's annular space (20), as claimed by amended claim 1 - However, when a structure recited in the reference is substantially identical to that of the claims (see Applicant's Figure 5, 6a; [0031]), claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Ohashi teaches a fluid flow divider (upper portion of 41, Figure 4) having a first flow path ("Sz") and a second gas flow path (Sx) coupled to an annular space (Sx). Ohashi further teaches a fluid flow divider being a disk (Figure 4) having a central orifice (17a) forming a first gas flow path and a plurality of small orifices (17b) forming a second gas flow path.

Ohashi further teaches a gas flow divider (upper portion of 61, Figure 6) which comprises a flange (see L shape of U/21 face, Figure 6) on the inlet end of the elongated inner tube (21,

Figure 6), a flange having a lip (20, Figure 6) containing a plurality of small orifices (20a, Figure 6) forming a second gas flow path.

It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace Soichiro Kawakami's support plate (4) with Ohashi's fluid flow divider, with an optimal number of orifice (17a), including optimizing a dimension(s) of Soichiro Kawakami's gas delivery metering tube and inner tube.

Motivation to replace Soichiro Kawakami's support plate (4) with Ohashi's fluid flow divider, with an optimal number of orifice (17a), including optimizing a dimension(s) of Soichiro Kawakami's gas delivery metering tube and inner tube as taught by Ohashi is for preventing particle adherence as taught by Ohashi ([0003], [0004]; Machine Translation) in Soichiro Kawakami's reactor (Figure 3). Further, motivation to dimension Soichiro Kawakami's gas delivery metering tube and inner tube wherein a cross sectional area of a inside of a elongated inner tube is approximately equal to a total cross sectional area of a plurality of small orifices in a flow divider is to provide for a desired pressure gradient. Further, it is well established that changes in apparatus dimensions are within a level of ordinary skill in a art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of Ishii (USPat. 5,685,942). Soichiro Kawakami and Ohashi are discussed above. Soichiro Kawakami and Ohashi do not teach:

i. a gas supply port comprising a block having a pocket formed arein, a pocket being sealed with a cover to create a confined passage, and a gas supply connector coupled to a pocket for receiving a gas and a hollow tube assembly coupled to a pocket and a inlet end (4/3 interface) of a inner and outer tube (3)s for conveying a gas.

Ishii teaches gas delivery system (91, 89, 85; Figure 4) for a wafer processing apparatus (column 3, lines 37-49). Specifically, Ishii teaches:

ii. a gas supply port (91; column 8, lines 16-22) comprising a pipe {block} having a pocket (conduit volume) formed arein, a pocket being sealed with a cover (pipe 91) to create a confined passage (conduit volume), and a gas supply connector (92) coupled to a pocket for receiving a gas and a hollow tube (89) assembly coupled to a pocket

It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace the gas conduit of Soichiro Kawakami and Ohashi with Ishii's gas supply port comprising the block instead of the pipe shape.

Motivation to replace the gas conduit of Soichiro Kawakami and Ohashi with Ishii's gas supply port comprising a block instead of a pipe shape is to provide an alternate and equivalent means for process gas delivery. Additionally, it has been established that the shape of a container is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container is significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966); MPEP 2144.04).

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of Lemp (USPat. 4,836,246). Soichiro Kawakami and Ohashi are discussed above. However Soichiro Kawakami and Ohashi

do not teach one or more standoff spacers attached to the elongated inner tube to axially align the elongated inner tube inside the outer tube.

Lemp teaches a similar gas distribution arrangement (Figure 1; column 2, lines 24-40). Specifically, Lemp teaches a standoff spacer (16, Figure 1) attached to the elongated inner tube (32) to axially align the elongated inner tube (32) inside the outer tube (12).

It would have been obvious to one of ordinary skill in that art at the time the invention was made to add a standoff spacer attached to the elongated inner tube to axially align the elongated inner tube inside the outer tube in the Soichiro Kawakami and Ohashi apparatus as taught by Lemp.

Motivation to add a standoff spacer attached to the elongated inner tube to axially align the elongated inner tube inside the outer tube in the Soichiro Kawakami and Ohashi apparatus as taught by Lemp is to support the elongated inner and outer tubes (column 2, lines 35-40).

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of DeDontney, Jay B. et al (USPat. 5,849,088). Soichiro Kawakami and Ohashi are discussed above. Soichiro Kawakami and Ohashi do not teach at least one injector assembly having at least one port for receiving the gas delivery metering tube. Soichiro Kawakami and Ohashi do not teach at least one shield assembly having at least one plenum for receiving the gas delivery metering tube.

DeDontney teaches a similar gas delivery system (Figure 3; column 5, line 61 – column 6, line 34). Specifically, DeDontney teaches an injector (14, Figure 3) and at least one shield assembly (40c,d; Figure 4) having at least one plenum (78) for a gas delivery metering tube (80).

It would have been obvious to one of ordinary skill in that art at the time the invention was made to provide a port in DeDontney's injector assembly for Soichiro Kawakami' and Ohashi's gas

delivery metering tube including replacing DeDontney's gas delivery metering tube with Soichiro Kawakami's and Ohashi's gas delivery metering tube.

Motivation to provide a port in DeDontney's injector assembly for Soichiro Kawakami' and Ohashi's gas delivery metering tube including replacing DeDontney's gas delivery metering tube with Soichiro Kawakami's and Ohashi's gas delivery metering tube is to distribute process gas as taught by Soichiro Kawakami.

Response to Arguments

6. Applicant's arguments filed August 24, 2007 have been fully considered but ay are not persuasive.

7. Applicant states:

"

Kawakami in view of Ohashi fail to teach or suggest a metering tube including a gas flow divider configured to introduce a first gas flow path into an inlet end of an inner tube and a second gas flow path into an annular space, wherein gas in said first gas flow path travels out of the outlet end of the inner tube adjacent a closed end of the outer tube and back into the annular space. Kawakami discloses a plasma CVD apparatus with a series of short, coaxial tubes. The apparatus includes an inner electrode and partition walls having openings, the openings in respective coaxial walls being spaced to diffuse gas exiting the apparatus. Gas flows through an inlet or supply pipe 5 and subsequently flows radially outward near the middle of cathode la. As gas flows radially outward, it is separated and diffused to unify the flow exiting the outermost openings.

"

And...

"

By directing the gas flow through the inner tube and out the end adjacent the closed end of the outer tube, uniform backing pressure is created. In the Kawakami apparatus, the gas flows out of the supply tube and then out opening 12a in a middle of partition tube 2c. Moreover, even if the gas is considered to flow out an outlet end of an inner tube, it exits at the middle of tube 1, not adjacent an end or even a closed end. Thus, if the gas were directed back into an annular space in the device of Kawakami, the backing pressure would not be uniform because the pressure would be applied only along half the space.

Ohashi fails to make up for the deficiencies ofKawakami. Ohashi discloses a cylinder with a straightening vane at an upper end. The straightening vane directs flow through a central portion at a different rate than it directs flow out openings in an outer portion. Thus, Ohashi is directed to adjusting the flow around the substrate relative to the central flow rate so as to minimize flow turbulence in the substrate area. Ohashi therefore fails to teach or suggest a gas flow divider and first gas flow path as called for by claim 1

"

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As proposed by the Examiner, the obviousness rejection is based on the teachings, as a whole, of both Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960). In particular, the Examiner asserted that Soichiro

Kawakami does not teach the claimed gas flow divider. However, the Examiner does find that the stated motivation to replace Soichiro Kawakami's support plate (4) with Ohashi's fluid flow divider, with an optimal number of orifice (17a), including optimizing the dimension(s) of Soichiro Kawakami's gas delivery metering tube and inner tube as taught by Ohashi is for preventing particle adherence as taught by Ohashi ([0003], [0004]; Machine Translation) in Soichiro Kawakami's reactor (Figure 3) is supported by the prior art.

Conclusion

8. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on the Monday through Thursday schedule

from 8am through 7pm. The official fax phone number for the 1792 art unit is (703) 872-9306. Any Inquiry of the general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.